IN THE CLAIMS:

Please find a listing of the claims below. The statuses of the claims are shown in parentheses.

1. (Currently amended) A test method, comprising:

squeezing a <u>thermally conductive</u> thermal interface material (TIM) sample at a plurality of different pressures at different times;

flowing heat through said TIM sample to create a gradient between a heat source and a cold sink at said plurality of different pressures;

measuring temperatures at a plurality of points along said thermal gradient at respective ones of said plurality of different pressures;

adjusting the pressure applied at each of said plurality of different pressures to maintain a constant pressure on the TIM sample even though said TIM sample expands and contracts with changes in its temperature; and

characterizing the thermal material properties of said TIM sample from calculations based on data obtained in the step of measuring <u>following a time when the temperature measurements in the step of measuring should have reached a steady-state according to a previous trial run of said TIM sample</u>.

2. (Cancelled).

3. (Original) The method of Claim 1, further comprising:

delaying the step of characterizing until temperature measurements in the step of measuring have reached a steady-state.

4. (Cancelled).

5. (Original) The method of Claim 1, further comprising:

first making a trial run of said TIM sample to determine a particular set of pressures to use in the step of squeezing.

6. (Original) The method of Claim 4, further comprising:

first making a trial run of said TIM sample to determine a time delay needed for steady-state thermal conditions.

7. (Original) The method of Claim 1, further comprising:

first making a trial run of said TIM sample to determine heating and cooling requirements needed to establish said thermal gradient.

8. (Currently amended) The method of Claim 1, further comprising:

computing a thermal resistance curve across intervening hot and cold blocks along said thermal gradient to extrapolate interface temperatures on opposite sides of said TIM sample; and

using ~~such~~ said interface temperatures in a calculation of the thermal resistance of said TIM sample at each of said plurality of different pressures.

9. (Original) The method of Claim 8, further comprising:

determining a relationship between temperature and distance along each of the hot and cold blocks at steady-state with simple linear regression.

10. (Currently amended) A materials testing system, comprising:

a fixture for placing a <u>thermally conductive</u> thermal interface material (TIM) between a hot and a cold copper block;

a press for squeezing the TIM between the hot and cold copper blocks at a plurality of pressures and for a plurality of durations according to a test profile;

a heater and cooler connected to the hot and cold copper blocks for creating a thermal gradient across the TIM;

a compensating controller adjusting the pressure applied to the TIM to be constant even though said TIM sample expands and contracts with changes in its temperature;

a set of sensors for collecting temperature information from the hot and cold copper blocks during the steps of squeezing and creating; and

a computer for building a thermal-resistance-curve model of said TIM sample from data obtained in the step of collecting temperature information<u>, wherein the computer is configured to build the thermal-resistance-curve model following a time when the temperature measurements in the step of collecting temperature information should have reached a steady-state according to a previous trial run of said TIM sample</u>.

11. (Original) The system of Claim 10, further comprising:

a gauge for measuring the thickness of said TIM sample at room temperature and at a test temperature.

12. (Original) The system of Claim 10, further comprising:

a computer for calculating a net heat passing through said TIM sample to account for

heat losses to the environment, and providing for a more accurate thermal resistance value to

be estimated.

13. (Original) The system of Claim 10, further comprising:

a plurality of thermocouples strategically disposed in the hot and cold blocks;

a computer for calculating a least-squares fit, with R^2 better than 0.99, that means

better than 99% of the variability in temperature is related to the differences in distance.

14. (Original) The system of Claim 10, further comprising:

a plurality of thermocouples strategically located and connected to provide data for a

least-squares-fit for reducing a dependency on individual thermocouple accuracy.

15. (Currently amended) A materials testing method, comprising:

placing a thermally conductive thermal interface material (TIM) in a fixture between a

hot and a cold copper block with parallel opposing faces;

squeezing said TIM sample between said opposing faces at a plurality of pressures

and for a plurality of durations according to a test profile;

creating a thermal gradient across the TIM with a heater and cooler connected to the

hot and cold copper blocks;

adjusting the pressure applied to the TIM to be constant even though said TIM sample

expands and contracts with changes in its temperature;

collecting temperature information from the hot and cold copper blocks during the

steps of squeezing and creating; and

building a thermal-resistance-curve model of said TIM sample from data obtained in

the step of collecting temperature information following a time when the temperature

measurements in the step of collecting temperature information should have reached a steady-

state according to a previous trial run of said TIM sample.

16. (Previously presented) The method of claim 15, further comprising:

automatically positioning said parallel opposing faces to maintain parallelism between

two contact surfaces so the positioning of the parallel opposing faces is not operator

dependent.

17. (Original) The method of claim 15, further comprising:

using no operator involvement in test fixture assembling and offline measurements.

18. (Original) The method of claim 15, further comprising:

applying pressure between said parallel opposing faces in the range of a few pounds

to in excess of 400 pounds.

19. (Original) The method of claim 15, further comprising:

using cyclic tests for special evaluation without returning to a starting point.

20. (Original) The method of claim 15, further comprising:

non-uniformly heating said TIM sample with a secondary heating block.

21. (Original) The method of claim 15, further comprising:

heating TIM samples from both sides during a pre-conditioning phase to minimize

wait time.

22. (Original) The method of claim 15, further comprising:

measuring TIM sample load and deflection simultaneously.

23. (Original) The method of claim 15, further comprising:

correlating TIM sample load and deflection.